BUILDING CAPACITY FOR THE ACHIEVEMENT OF THE GLOBAL STRATEGY FOR PLANT CONSERVATION IN THE CARIBBEAN REGION[1]

Colin Clubbe[2]

Abstract

Politically and botanically diverse, the Caribbean region is a biodiversity hotspot. Current estimates for seed plant species richness are nearly 11,000 indigenous taxa, of which approximately 72% are endemic to the region. Politically, the region comprises independent countries as well as overseas territories and countries of the European Union member states and the United States. Success in implementing the 2010 targets of the Global Strategy for Plant Conservation (GSPC) across the region was mixed, and a lack of capacity was consistently cited as a major impediment to full implementation. Several regional initiatives promote coordinated conservation activities and disseminate key information needed for GSPC implementation, including the Caribbean Botanic Gardens for Conservation, whose last meeting in Cuba identified capacity gaps needed for achieving GSPC success. This echoed an earlier regional GSPC workshop held in Montserrat and coordinated by Royal Botanic Gardens Kew and the Secretariat of the Convention on Biological Diversity (SCBD). RBG Kew has an active regional training program and is working with international partners to respond to needs identified locally. This coordinated approach, together with the development of the GSPC Toolkit, can provide a roadmap to meet the challenges of building capacity to achieve the revised 2020 targets in this biodiverse region.

Key words: Botanic gardens, Global Strategy for Plant Conservation (GSPC), networks, training, United Kingdom Overseas Territories (UKOT), West Indies.

The Caribbean region is politically and botanically diverse and comprises an archipelago of more than 1000 islands spread over approximately 3000 km separating the Atlantic Ocean from the Caribbean Sea. Politically, the region comprises 13 independent nations as well as overseas territories and countries of the European Union member states and the United States. A recognized biodiversity hotspot (Myers et al., 2000), current estimates for seed plant species richness are nearly 11,000 indigenous taxa, of which approximately 72% are endemic to the region (Acevedo-Rodriguez & Strong, 2008a, 2008b; Maunder et al., 2008, 2011); however, much of the region is experiencing increasing pressure from the familiar drivers of biodiversity loss, e.g., habitat loss and fragmentation, often driven by development, invasive species, pollution, and, increasingly, the negative impacts of global climate change (Millennium Ecosystem Assessment, 2005; Critical Ecosystem Partnership Fund, 2010).

The Global Strategy for Plant Conservation

A global analysis of the extinction risk for plants has revealed that more than 20% of the world's plant species are threatened with extinction and that human actions pose the greatest threats to the future of plant diversity (Plants Under Pressure, 2010). The Global Strategy for Plant Conservation (GSPC) aims to halt the current and continuing loss of plant diversity (Convention on Biological Diversity [CBD], 2002) and provides a challenge and opportunity for the international community (Wyse Jackson & Kennedy, 2009). Implementing the GSPC is based on achieving 16 outcome-oriented targets, initially by 2010, and now revised and updated for implementation by 2020 (CBD, 2011a). Achievement of the targets of the GSPC requires considerable capacity, and, consequently, Targets 15 and 16 of the GSPC focus on building capacity. Target 15 focuses on building individual skills and facilities, in particular "The number of trained people working with appropriate facilities sufficient according to national

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[2] Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, United Kingdom. c.clubbe@kew.org.

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needs, to achieve the targets of this Strategy" (CBD, 2011d). Although Target 15 focuses on individuals, GSPC Target 16 stresses the collective importance of maintaining networks and partnerships: "Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels..." (CBD, 2011d). The GSPC estimates that the number of trained people working in plant conservation worldwide would have to double by 2010, and although a few national needs assessments have been undertaken, we have fallen well short of this figure (SCBD, 2009). Progress has been made in increasing the number of trained people working in conservation, and several institutions have ambitious international training programs, including the Royal Botanic Gardens Kew (RBG Kew), Chicago Botanic Garden, South African National Biodiversity Institute, and Botanic Gardens Conservation International (BGCI). However, the training impediment remains, and, consequently, Targets 15 and 16 in the revised GSPC 2011–2020 remain almost unaltered (CBD, 2011d). An exciting initiative to help implement the GSPC and to support the attainment of the targets is the development of a web-based GSPC Toolkit, launched in 2011, mediated by the Global Partnership for Plant Conservation (GPPC) and maintained by BGCI (Plants 2020, 2013).

CAPACITY BUILDING FOR GSPC IMPLEMENTATION IN THE CARIBBEAN

The RBG Kew has an active capacity-building program based on courses and individually tailored training on the Kew and Wakehurst Place sites, as well as an active regional program working with in-country partners (Clubbe et al., 2008; RBG Kew, 2011). The International Diploma Programme is the main capacity-building program at Kew and comprises four specialist professional training courses of five to eight weeks in duration. The topics comprise Botanic Garden Management, Plant Conservation Strategies, Herbarium Techniques, and Botanic Garden Education. These courses have recently been reviewed and restructured specifically to support implementation of the GSPC and to provide participants with specific skills and tools in the spirit of meeting GSPC Target 15. The course alumni comprise a powerful network sensu GSPC Target 16 that works on two levels. Such strong bonds are formed within a course that these relationships thrive and form a mutual support network, regardless of where in the world participants return to. Individual course members are then introduced to the wider alumnus via the "On Course" alumnus newsletter; many new relationships have been established via the recognition of common interests or local proximity. To date, 417 participants representing 109 countries and territories have taken a course in this programme, including 30 from 14 Caribbean nations and territories. This forms a powerful international network for implementing the GSPC. Core to this home-based program is the recognition that there is much to be gained from the international flavor and lifelong friendships created by bringing together a group of specialists for a course at Kew. Here, we can draw on wider expertise from, e.g., BGCI, other botanic gardens, and university-based colleagues to provide a stimulating forum for gaining knowledge, sharing experiences, and seeking solutions.

Kew's regional training programme is often based on an existing relationship with a former course alumnus who has returned home after taking one of the Kew courses. While implementing knowledge and skills gained during the Kew course, they identify the need and an opportunity to develop a regional course. In recent years, two such courses have been developed and run in the Caribbean region. In 2007, with funding from the United Kingdom's Department for Environment, Food and Rural Affairs (Defra), Kew teamed up with the Secretariat of the CBD (SCBD) and the BGCI to develop and run a Caribbean regional GSPC workshop. We were collaborating in a Darwin Initiative–funded project in Montserrat at the time (Hamilton et al., 2008) and so worked with our local partners to provide the context and some field experiences to illustrate what implementing the GSPC could look like. The organizing team involved three alumni, including the SCBD's GSPC Programme Officer, and two Montserratian forest officers. The funding enabled us to bring 15 participants from across the Caribbean to Montserrat to discuss GSPC implementation and the barriers to successfully meeting the targets, to review regional activity, and to explore regional cooperation. Experiences varied from Trinidad, where a national GSPC committee was already constituted, to St. Kitts and Nevis, where there was little knowledge at that stage of the GSPC. Significantly, relatively few Caribbean nations had appointed a GSPC national focal point and provided feedback to the SCBD; this has encouraged the implementation of this directive, although there are still only five Caribbean GSPC national focal points (CBD, 2011c). The Plant Conservation Report noted with disappointment that less than one third of parties to the CBD have appointed a national GSPC focal point (SCBD, 2009). The workshop has catalyzed action, e.g., the Trinidad delegate stated that he now had the framework to provide a re-invigorated agenda for the Trinidad and Tobago national GSPC committee and that this was being implemented. The St. Kitts and Nevis delegate stated that he now had the knowledge to start discussing national implementation.

An active network in the region is the Caribbean Botanic Gardens for Conservation. The network was originally established through a project funded by Cable and Wireless and coordinated by BGCI to strengthen the capacity of botanic gardens in the region for plant conservation and environmental education (Wyse Jackson, 1998). One of the outputs of the project was a conservation action plan, which, although published before the GSPC was adopted, identified many key issues and capacity gaps that still remain unfilled today (Burbidge & Wyse Jackson, 1998). At their most recent conference in Cuba, the network considered progress in implementation of the GSPC as one of its key themes, and presenters reviewed implementation at a global scale (Wyse Jackson, 2010) and a subregional level (Clubbe & Hamilton, 2010), both identifying gaps in capacity and the need to accelerate progress in meeting GSPC Targets 15 and 16 as key issues. Nine alumni from the Kew programme were delegates at this conference, presenting four oral papers and three posters; all are still very active in the field.

A recent review of progress toward implementing the GSPC in the Caribbean revealed that, although success had been variable, substantial progress had been made in many targets in Cuba, Cayman Islands, Guadeloupe, and Martinique in particular (Torres-Santana et al., 2010). The review also identified some of the priority needs and knowledge gaps, including limited financial resources, understaffing, lack of local training and appropriate equipment, lack of adequate protection of important plant areas, ineffective enforcement of environmental laws, limited flow of information, including difficult Internet access, and lack of environmental awareness among the public. Many of these are key needs for capacity building. Torres-Santana et al. (2010) identified the GSPC Target 1, "a widely accessible working list of known plant species, as a step towards a complete world flora" (CBD, 2002), as one of the targets achieved most consistently across the region where it was mostly achieved or good progress noted, with only Anguilla reporting no progress. This is critical because of the underpinning nature of the GSPC Target 1 (Paton & Nic Lughadah, 2011). At a global scale, the launch of the Plant List in December 2010 was a milestone, providing free, easy access to a web-based world checklist of plants (cf. The Plant List, 2013). With any undertaking of this nature and scale, it is a work in progress, and data quality is being regularly improved as a result of feedback and increased knowledge. With the launch of the Plant List, the GSPC Target 1 was achieved and the basis set for achieving the revised Target 1, "an online flora of all known plants," (CBD, 2011d) by 2020. The further implementation of GSPC Target 1 is to provide the same access and information at various scales. At the Caribbean regional scale, the Flora of the West Indies project has brought together a specimen-based distributional checklist for the West Indies that provides access via one web portal to all the indigenous taxa known from this region (Acevedo-Rodriguez & Strong, 2008b). At a subregional scale, the United Kingdom Overseas Territories (UKOT) Online Herbarium project provides a single web-based checklist and botanical information portal (UKOT, 2013). Again, the backbone of this are the plant species lists and specimen information for the five Caribbean UKOTs within the larger database dealing with all 16 territories. This also brings together other botanical resources in support of conservation action on the ground and implementation of the GSPC (Clubbe et al., 2010a). It is vitally important to support in-country partners with training in the core skills needed to use these resources and contribute to their continued use and success. At Kew, specific training is provided in these skills, including plant identification through the Tropical Families identification course as well as providing facilities to use the herbarium and work alongside experienced Kew botanists or taking the Herbarium Techniques course (RBG Kew, 2011). In-country, we work with local partners to put together workshops, courses, or other one-to-one training activities that respond to the identified local needs. For example, in 2007 we ran a Caribbean regional herbarium management course in Trinidad in collaboration with the National Herbarium, which focused on the role of the herbarium in conservation. Twenty-five participants from across the region attended and engaged in lively debate, including opening up herbaria and making their activities more relevant; a GSPC framework helped to facilitate this debate. Access to reliable, up-to-date plant taxonomic information was identified as one of the key barriers, and the development of online databases and online resources such as the digital library of JSTOR (2013) and the Biodiversity Heritage Library (BHL, 2013) are seen as real solutions. The challenge now is to accelerate global access to plant diversity information (Nic Lughadah & Miller, 2009). The production of locally specific field guides is also an important excellent contribution to improving access to plant diversity information, e.g., the guide to wild plants of Antigua and Barbuda (Pratt et al., 2009).

Targets 1 and 2 of the GSPC go hand in hand. Regional collaboration is vital to achieve GSPC Target 2: "a preliminary assessment of the conservation status of all known plant species, at national, regional and international levels." At a local level, success can be achieved where all the key stakeholders can be brought together in a workshop to assess the species endemic to individual islands and publish a Red List, e.g., the Cayman Islands (Burton, 2008) and Antigua and Barbuda (Pratt et al., 2009). For more widespread species, broader collaboration and data exchange are required, and there now needs to be much greater regional collaboration to achieve the red listing of the whole Caribbean flora. Several initiatives are underway in conjunction with training activities in applying the International Union for Conservation of Nature and Natural Resources (IUCN) Red List Categories and Criteria (IUCN, 2001); Red List training forms a key component of all the Kew regional courses and workshops. The Plants Under Pressure (2010) report by Kew highlighted that less than 3% of known plant species are currently on the IUCN Red List of Threatened Species, and the GSPC Target 2 activities need to be scaled up significantly if we are to meet the revised Target 2 by 2020. Future progress in plant red listing requires greater participation by the world's herbaria and increased support for expert networks (Schatz, 2009). New tools and techniques, as well as training in their use, are being developed to try and plug this gap (Bachman et al., 2011).

In addition to the sufficiency of trained people noted for GSPC Target 15, Target 16 further emphasizes the need for appropriate facilities, which provides different challenges and resource needs in meeting particular targets; capacity building needs to be directed at targets individually. For example, Kew's Millennium Seed Bank Partnership (MSBP) has an active Caribbean program and supports several local seed collector posts in the smaller islands where resources are very scarce. Training is provided and a collection strategy developed (MSBP, 2013). GSPC Target 8 refers to ex situ collections, at least 75% being preferably in the country of origin (CBD, 2011d). Some of the larger Caribbean countries such as the Dominican Republic are keen to develop their own local seed banking facilities and the MSBP is supporting these developments with technical assistance. However, many of the smaller islands, including the UKOT, prefer to keep their seed in long-term storage off-island and away from electricity surges, power outages, and threats from hurricanes. In these cases, the MSBP is able to offer free storage on mutually agreed terms in the MSBP at Wakehurst Place (MSBP, 2013).

At Kew, seed that is to be banked at the MSBP undergoes germination testing, and key species are grown in the Kew nurseries until flowering; a horticulture protocol is produced, which is shared with country partners. Parallel testing is undertaken in countries where horticultural facilities are available, and training is provided where needed. The protocols enable in-country horticulturists to more successfully grow plants for conservation, restoration, display, and education (Corcoran et al., 2010). It is these types of practical activities that we see as helping build capacity to meet GSPC Target 3: "information, research and associated outputs, and methods necessary to implement the Strategy developed and shared" (CBD, 2011d). These threatened species then go on display at Kew; the stories of these unique plants and their ongoing threats are told to the visiting public. This directly contributes to meeting the GSPC Target 14 on raising public awareness in the United Kingdom. A wide range of awareness-raising activities is also undertaken in the Caribbean as an integral part of all projects. These include talks in schools and to the general public, opportunities for people to join/observe fieldwork, plant naming competitions for endemic species without a local name, and the production of informative posters.

In-country support for developments in botanical infrastructure includes the establishment of native species nurseries with local botanic gardens and national trusts, as well as horticulture skills training where needed (Clubbe et al., 2010b). Native species nurseries provide varied functions. For example, at the Queen Elizabeth II Botanic Park in the Cayman Islands, the use of native species in landscaping is encouraged in response to current usage of non-native, and in some cases, invasive species (Clubbe et al., 2010c). In the Turks and Caicos Islands, the focus is on establishing an ex situ collection of the endemic *Pinus caribaea* Morelet *bahamensis* (Griseb.) W. H. Barrett & Golfari, which is being devastated in the wild by an invasive scale insect. This genetically diverse collection can then form the basis of a reintroduction program once the scale infestation has been controlled.

There needs to be a well-documented way to agree on priorities and actions and to measure success in implementing the GSPC. Consequently, the importance of developing realistic, accurate, and agreed upon management plans is vital. Ideally, species and habitat data should be integrated into an overall habitat-based plan, which links directly to or is actually part of the National Biodiversity, Strategy and Action Plan (NBSAP) as covered under the CBD (2011b). Achieving the GSPC targets is best integrated directly into this process, and this can be done by facilitating participatory workshops that bring all stakeholders together to agree on requirements and actions and to identify resource needs.

TOWARD MEETING THE GSPC 2020 TARGETS

Do we have the capacity to achieve the 2020 targets in the Caribbean region? There is good progress in several areas, but many challenges remain. There needs to be greater mainstreaming of the GSPC. We need to increase the number of GSPC focal points to better champion the GSPC locally. Botanical capacity is still a challenge and provides opportunities for the larger, international institutions to work in partnership to help provide focused capacity building. There needs to be a better career structure for botanists and plant conservationists to retain trained personnel. There is still a lack of adequate botanical infrastructure in many places that needs to be urgently addressed. We need to strengthen international partnerships, and we need better support for existing networks to improve what they are already doing. All of these require financial investment at a time when resources are difficult to secure, and plant conservation is not necessarily seen as a priority at a political level. We can work more efficiently by maximizing the use of new technologies and communication tools and can catalyze positive action by exploring the role and use of social networking that is proving to be so successful in many walks of life.

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